

TIMBER PRODUCTION IN THE OTWAY REGION

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ABSTRACT: The paper describes the native hardwood forests and the softwood plantations of the Otway Ranges. It traces the history of timber utilisation and discusses the present and potential significance of the region for timber production.

INTRODUCTION

The area of significance for commercial timber production comprises State Forest and associated forested freehold land in and adjacent to the main Otway Ranges between Anglesca and Princetown.

Approximately 100,500 ha have been dedicated as Reserved Forest and a further 27,700 ha are designated as Protected Forest. The Forests Commission is responsible for the control, management and protection of Reserved Forest. In Protected Forest the Commission's responsibilities relate mainly to the management and protection of the vegetation, although the land itself is under the control of the Department of Crown Lands and Survey.

Reserved Forest and Protected Forest together comprise State Forest as defined in the Forests Act 1958.

STATE FOREST MANAGEMENT OBJECTIVES

The management objectives for the Otway State Forest include:

- (1) Protection of the forests and their associated vegetation and fauna from damage by wildfire and from injury from biological agencies.
- (2) Provision of a continuing supply of hardwood sawlogs, pulpwood and other forest products at a level which is consistent with the growth of the forests.
- (3) Protection of water catchments.
- (4) Conservation of landscape values, wildlife habitat, flora and other environmental values.
- (5) Provision of facilities for public recreation and education.
- (6) Establishment of softwood plantations to augment wood supplies from the hardwood forests and to support a viable forest products industry based largely within the locality.

THE NATIVE HARDWOOD FORESTS

Eucalyptus species occurring naturally in the area are:

- **E. regnans* F. Muell.—mountain ash
- **E. obliqua* L'Hérit.—messmate.
- **E. baxteri* (Benth.) Maiden and Blakely—brown stringybark.
- **E. globulus* Labill.—southern blue gum.
- E. st. johnii* R. T. Baker—Victorian blue gum.
- **E. cypellocarpa* L. Johnson—mountain grey gum.
- **E. viminalis* Labill.—manna gum.
- **E. sideroxylon* A. Cunn. ex Woolls—red ironbark.
- E. radiata* Sieber—narrow leaf peppermint.
- E. nitida* Hook—shining peppermint.
- E. aromaphloia* L. D. Prior and J. H. Willis—scent bark.
- E. ovata* Labill.—swamp gum.
- E. goniocalyx* F. Muell. ex. Miq.—long leaf box.
- E. kitsoniana* Maiden—bog gum.

**Species of significance for timber production.*

Other native species which have some potential for specialised timber products include:

- Acacia melanoxylon* R. Br.—blackwood.
- Nothofagus cunninghamii* (Hook) Oerst.—myrtle beech.
- Phebatium squameum* (Labill.) Engl.—satin box.

FOREST TYPES

Three broad vegetation types based on potential timber productivity have been recognised for wood production planning purposes. The locations of these types are shown in Fig. 1.

(1) *Mountain forest:*

This is defined as all mountain ash forest and forests of other species having a mature stand height exceeding 40 m. This forest type coincides closely with the

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boundary of understorey species such as *Olearia argophylla* (Labill.) Benth. (musk) which are favoured by high rainfall, and it corresponds roughly with the 1,500 mm rainfall isohyet on the northern slopes of the ranges and the 1,150 mm isohyet on the southern slopes.

The main eucalypt species are mountain ash, messmate, manna gum, swamp gum, southern blue gum and mountain grey gum.

The trees in the virgin mountain forests were very large and early photographs of Beech Forest show trees with girths well in excess of 10 m. Record exists of one mountain ash tree which was over 100 m tall.

About 41,000 ha of mountain forest are within State Forest (Reserved Forest 37,000 ha and Protected Forest 4,000 ha), and this area includes some 11,000 ha of dense regrowth forest which resulted mainly from the extensive 1919 forest fires. This regrowth is of considerable importance for future timber production. The area of mountain forest in private ownership is not large; however there are some 2,600 ha in areas controlled by water supply authorities in the headwaters of

Gellibrand River and Olangolah Creek (Colac water supply) and Arkins Creek (Warrnambool water supply).

(2) Foothill forest:

This is defined as all forest with a mature stand height from 15 m to 40 m.

The main eucalypt species are messmate, mountain grey gum (mainly on the northern side of the main Otway ridge), southern blue gum (mainly on the southern side of the ridge), brown stringybark, manna gum and narrow leaf peppermint. A limited occurrence of red ironbark occurs in the relatively dry forest adjacent to Aireys Inlet.

There are about 61,000 ha of foothill forest type in State Forest in the area, and there are also substantial areas under private ownership.

(3) Low forest and heathland:

This is defined as all areas in which the mature stand height is less than 15 m.

Although this type covers about 22,000 ha of State

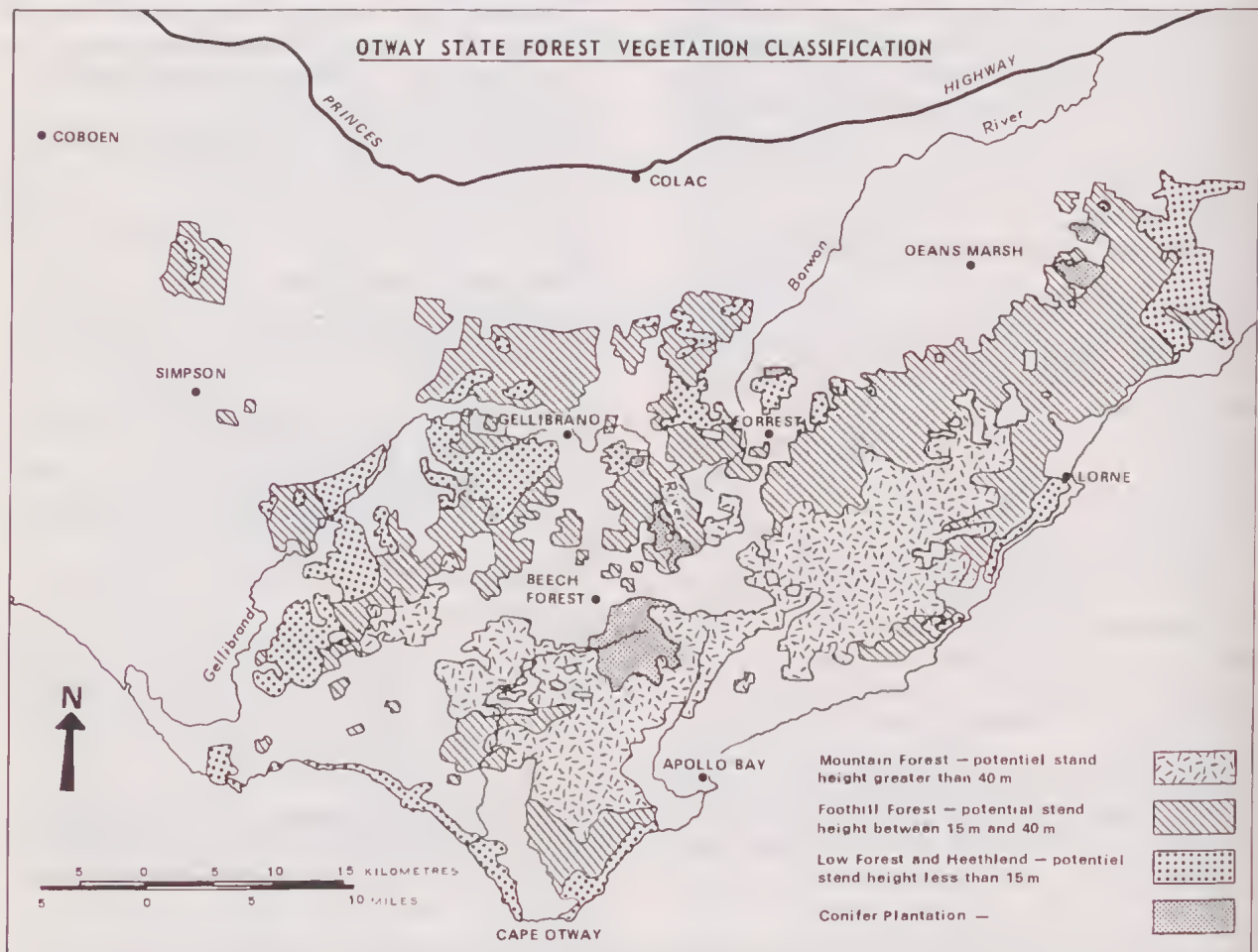


FIG. 1

Forest it is of little value for timber production. It falls into two main categories:

- (i) dense but stunted tree cover on exposed coastal situations, and
- (ii) predominantly heathland with a relatively open cover of stunted trees on poor soils which have developed in many areas on Tertiary sediments.

HISTORY

The present hardwood forests are the remnants of magnificent forests which, prior to settlement, covered practically the whole of the Otway area. They originally comprised some 35,000 ha distributed as 230,000 ha in the County of Polwarth and 120,000 ha in the County of Heytesbury (Forests Commission 1963).

Timber utilisation has been an important element in the history of the Otways, and the production of blue gum sleepers for Victorian Railways from Apollo Bay and Loutit Bay was recorded as early as 1850 (Thornley 1974). The timber was transported by sea, which was the only link with the outside world.

Lack of access presented a problem for both settlement and timber utilisation right from the earliest days of development. In winter access was particularly difficult due to the high rainfall and the intractable nature of the Otway mud, characteristics which have made the development of wet weather land transport links both difficult and costly to the present time.

By 1858 a steam-powered sawmill had been constructed at Apollo Bay, and several boom years of timber production in the area followed. However by 1865 production had declined due to the completion of the railway contracts.

The timber industry in the Otways has been characterised by periods of boom and depression, and it was not until the 1880s that there was a resurgence of sawmilling activity. In 1882 a large sawmill commenced operations at the Elliott River, to the southwest of Apollo Bay, and continued operating until the 1920s. On the inland side of the ranges sawmills were established at Barramunga, to the south of Forrest. The opening in 1891 of the broad gauge Birregurra to Forrest railway gave a great boost to sawmilling in this area, and extensive networks of forest tramlines were developed which linked with the Forrest railhead (Light Railway Research Society 1974). Sawmilling development also took place at Barwon Downs.

In the latter part of the nineteenth century there was considerable emphasis on opening up the Otways for settlement, and much prime forest land was alienated. An example of this was the Beech Forest area, made available for settlement in 1886.

The policy was deplored by a number of officials who recognised the value of these areas for timber

production. Thus, in a report for the Government on the Cape Otway forests F. D'A. Vincent (1887) was critical of the release of forested land for settlement. He reported: 'The country is unsuitable for cultivation being extremely hilly and broken' and 'There is every reason to suppose that much of the land has been taken up for the sake of the timber

Despite strong recommendations in 1897 by the then Surveyor-General (S. K. Vickery) and the Inspector of Forests (J. Blackburne) 'that all unalienated lands in the Otway district, as indicated, together with any allotments relinquished or forfeited, should be incorporated in this forest' further alienation was permitted, and during the period 1899 to 1904 the Benwerrin and Wymboliel lands were thrown open for selection in the Parish of Lorne.

The narrow gauge railway which was completed from Colac to Beech Forest in 1902 and extended to Crowes in 1911 marked the intensification of sawmilling and paling splitting in the western part of the Otway Ranges. Where previously the produce had been carted over tracks to Colac or shipped from Apollo Bay, the railway in the ranges now provided an outlet for larger volumes of timber.

Under the Forests Act of 1907 a Forests Department was constituted on 4 February 1908. The new Department commenced a long term campaign to halt the unwise alienation of forested Crown land, and in its Annual Report of 1910 it stated: 'It will be an ill day for Victoria if the partially denuded forest lands of Central and Eastern Otway are permitted to be sacrificed to a few families of selectors who do not now improve properly or till successfully the lands they occupy. Indeed a marked feature of this district is the wilderness of inferior growth and scrub, the result of partial clearing by fire, which is taking the place of the great forest of blue gum and ash which once occupied it'.

The Forests Act of 1907 defined areas of permanent forest in the Otways with a total area of 78,700 ha, but the Act made provision for revision of the area where any of this land was required for settlement during the ensuing five years. 35,150 ha were so excised by 1911. The Department then reported: 'Although officers of Lands and Forests Departments who are charged with the duty of recommending excisions and additions listed large areas of valuable timber to take the place of those excised, nothing has been done to proclaim any new reserves.'

In the Forests Department's Annual Report of 1911 it was stated: 'Attempts have been made during the year past, and successfully resisted, to secure further alienation of the scattered remnants of the one time magnificent Otway Forest which when bounded by the Gellibrand River and Bass Strait was by far the finest reserve in Victoria. A great deal of employment is

now being given to timber cutters on the central tableland and the returns from timber there as a rule are much better than from root crops or grazing.'

In February 1919 devastating fires swept the Otways and further decimated the forests. These caused property losses from which many settlers were unable to recover, and so they left their farms. A direct result of the holocaust of 1919 was the prolific regeneration of the high quality forests of the area, and abandoned farmland carrying belts of this regeneration was purchased by the Forest Commission.

Substantial areas of abandoned farmland were also purchased for reforestation by the Commission during the 1920s in the Parish of Olangolah. It is noteworthy that, despite agitation for further excisions in 1924, approximately 4,000 ha of previously alienated land were re-dedicated as permanent forest so that nearly 90% of the original 1907 reservation was by 1926 retained as forest reserve.

However, after the first World War, settlement in the western portion of the County of Heytesbury was intensified and the area of forested Crown land was reduced from 120,000 ha to 36,000 ha.

The post-war period also coincided with a timber boom and in 1922 twelve sawmills were working full time along the Beech Forest to Crowes railway. The boom was shortlived, however, and by 1931 shortage of accessible timber combined with the general economic depression forced the closing of most of the mills.

Some forestry projects of lasting benefit were undertaken during the 1930s using unemployment relief labour. These included the cutting of forest access tracks, thinning and timber stand improvement works in the native forests, and the commencement of the Aire Valley softwood plantation.

In 1939 the forests of the area were again swept by major fires which were largely confined to the northerly aspects of the ranges. These destroyed some of the young age classes and caused deterioration of the older trees on the areas burnt.

After the second World War the housing boom caused a great demand for timber, and the Commission embarked on a major road construction programme in the Otways to make prime stands of milling timber accessible for utilisation by modern tractor and motor truck harvesting methods in place of the earlier winch and tramline. The last timber tramway, which closed in 1948, was Henry's Mt. Sabine line which carried timber from bush sawmills to the Forrest-Apollo Bay road.

Most of the major road construction to tap timber supplies was completed by 1959. The roads constructed included the Seaview, Aire Valley, Old Bay, Binns, Calder Ridge and Parker Ridge roads in the

western Otways, and the Grey River, Kaanglang and Mt. Sabine-Benwerrin roads in the eastern Otways.

The annual cut of hardwood sawlogs from State Forest was approximately 110,000 m³ during the late 1950s.

In 1952 some 28,000 ha of forested land in the County of Heytesbury was assigned to the Soldier Settlement Commission for the development of farming lands. An estimated 8,000 ha of this was considered suitable for retention as permanent forest reserve. However representations for such reservation were not successful.

The late 1950s also saw emphasis being given to the environmental and recreational values of the forests and a number of scenic reserves were set aside, including those at the Grey River (48 ha), Calder River (37 ha) and Maits Rest (74 ha). Further extensive reservations for scenic and recreational purposes were made in 1970 and 1972 with the declaration of the Angahook and Lorne Forest Parks, of some 2,900 ha and 3,680 ha respectively.

PRESENT MANAGEMENT

Present hardwood timber harvesting is aimed at using as much as possible of the old growth forests outside Forest Parks and special reservations, and then harvesting the second growth forests which have resulted from earlier timber extraction and from fires, especially the 1919 fires.

The annual authorised cut of 50,000 m³ of hardwood sawlogs from State Forest provides supplies to 12 sawmills at Colac, Apollo Bay, Gellibrand, Barwon Downs, Birregurra and Geelong.

A similar quantity of pulpwood is also estimated to be available, and Smorgons Consolidated Industries Pty. Ltd. is currently taking a substantial part of the available pulpwood for its packaging paper and paper-board plant in Melbourne.

The development of this pulpwood market has led to more efficient forest management. The utilisation of pulpwood facilitates the economic procurement of sawlogs from defective trees, as the parts of the trees which are unsuitable for sawlogs usually contain material suitable for pulpwood. This reduces the volume of forest residue left after logging, and enables cheaper and more effective regeneration operations.

The continued supply of optimum quantities of timber from the hardwood forests of the Otways depends on the transfer of harvesting operations from the rapidly dwindling areas of old growth forest to the younger regrowth forests, and especially to those which resulted from the 1919 fires.

The young trees, saplings and regeneration already on site form the basis of timber utilisation for at least the next 60 years, and the regeneration developed



PLATE 13

Tramways were the main means of transporting logs and timber from the forest prior to the Second World War. The one shown was part of J. H. Henry's 3' 6" gauge line south of Forrest.

following the future harvesting of these trees, and from the reforestation of non-productive areas, will provide the basis for timber production thereafter.

The main requirements for successful seedling establishment are a receptive seed bed, which favours germination and promotes rapid growth, and an adequate seed supply.

In the mountain forest harvesting and regeneration is normally achieved by the clear felling of defined cutting areas, so that operations are concentrated and the new forest is established in conditions of suitable seed bed with maximum sunlight and without competition from an overstorey. This method is essential for such species as mountain ash where intense burning of the site is necessary to stimulate the natural regeneration process of the species.

Rapid re-establishment of understorey species following logging is a feature of the Otway mountain forests and this has often precluded satisfactory regeneration operations. Acceptable chemical techniques have now been developed to suppress the invading scrub species and thus facilitate the burning and subsequent seeding operations.

As well as mountain ash, a local provenance of messmate known as 'Otway messmate' has proved to be a particularly fast growing variety (Pederick 1974), and is used in reforestation operations in the mountain forest zone.

The regeneration of the foothill forests is more easily achieved, and harvesting is normally carried out with the retention of regulated numbers of overwood trees which supplement the seed source on the ground. This method results in adequate regeneration in this forest type. This system of management also enables selected trees to be retained for further growth, or for fauna habitat, and to soften the visual effect of harvesting operations.

POTENTIAL PRODUCTION

Due to the effects of early unregulated timber exploitation, abortive settlement schemes, wildfires, and the difficulty of establishment of regeneration in the mountain forests, the Otway hardwood forests are not yielding anywhere near their high potential for timber production.

The mountain forests are potentially capable of producing wood fibre at a mean annual increment rate of the order of 15 to 20 m³ per ha, and such yields could eventually be expected from the gentler slopes of the main Otway ridge and its associated spurs, and the catchment of the Aire River, where development of intensively managed forests for timber production is a practicable strategy.

The foothill forests are less productive and a mean

annual increment of the order of 3 to 4 m³ per hectare is expected from the better-class managed forests.

SOFTWOOD PLANTATIONS

GENERAL

Commercial softwood plantation projects in the Otways have been a mixture of successes and failures. The early coastal plantation projects by the Commission at Waarre, near Port Campbell (1919 to 1936), and at Anglesea (1924 to 1934) were planned in accordance with the philosophy of the day, whereby only land which was unfit for settlement and unsuitable for hardwoods was considered for plantations. Unfortunately these areas, by and large, also proved unsuitable for softwoods.

However the plantings commencing 1930 on abandoned farmlands at Aire Valley were on high quality forest sites with high rainfall, and outstanding plantations have developed in this area.

The more recent plantings in the Gellibrand locality, and in the eastern Otways have been on satisfactory sites and overall in the Otway area there are now over 4,000 ha nett of successful State softwood plantations, and this area is planned for continued expansion to build up a total plantation resource of some 8,000 ha. This is designed to provide sawlogs for the local sawmilling industry, and veneer logs, pulpwood and round posts and poles for preservation.

In recent years there has also been an increasing interest in plantation development by private wood-based industries and the area of young private plantations in the Otways is currently about 1,400 ha.

SPECIES

The main species used in the State plantation programme were:

- Pinus radiata* D. Don—radiata pine
- P. nigra* Arnold—Corsican pine
- P. pinaster* Ait.—maritime pine
- P. muricata* D. Don—bishop pine
- P. ponderosa* Dougl.—western yellow pine
- Pseudotsuga menziesii* (Mirb.) Franco—douglas fir
- Picea sitchensis* (Bong.) Carr—sitka spruce
- Sequoia sempervirens* (D. Don) Endl.—Californian redwood

HISTORY

(1) *Waarre Plantation*: Plantating commenced in 1919. However a fire destroyed most of the pre-1926 plantings. The effective area of the plantation in 1955 was 570 ha comprising maritime pine (310 ha), radiata pine (209 ha), bishop pine (34 ha), and Corsican pine (17 ha).

Growth over most of the plantation was unsatisfactory due to soil deficiencies, drainage problems and coastal exposure. A marked exception to this, how-



PLATE 14

Modern machinery is now essential for economical timber harvesting and transport. This tractor, fitted with winch and skid pan, is hauling logs from the Aire Valley plantation.



PLATE 15

(Left) Mountain ash reaches optimum development in the high rainfall mountain forest on and adjacent to the main Otway ridge.

(Right) Fine stands of red ironbark occur in the drier areas near Aireys Inlet.

ever, was some 25 ha of radiata pine growing on limestone on the north side of the Sherbrook River.

In 1963 it was decided to abandon the area as a commercial plantation, to salvage most of the merchantable produce over a ten year period, and to leave a park-like area of the better quality pines for shelter and recreational use adjacent to the Sherbrook River. This program has now been carried out.

(2) *Anglesea Plantation*: Planting commenced in 1924 and continued until 1933. At this time the plantation was over 1,760 ha nett area and comprised mainly radiata pine (1,340 ha) and maritime pine (360 ha).

By 1929 it was realised that there were serious growth problems and in 1934 it was decided to cease further plantings in all coastal plantations, including Anglesea.

In the late summer of 1936 fires swept a considerable portion of the plantation and virtually destroyed the area as a viable plantation unit.

Subsequent research work has shown that commercial timber could be grown on much of the area if appropriate site preparation and phosphate fertilisers are used. However the area is no longer State Forest.

(3) *Aire Valley and Websters Hill Plantations*: Planting at Aire Valley commenced in 1930 on former farm land which had been acquired by the Commission.

In line with Commission policy at the time, the most favoured parts of this 1,800 mm rainfall site were planted with douglas fir, sitka spruce, bishop pine, western yellow pine, and Californian redwood, with a protective fringe of radiata pine, which at the time was regarded as an inferior species, on the upper slopes and ridges. Planting was largely completed by 1939. The current nett planted area is about 2,000 ha, mainly of radiata pine (47%), douglas fir (23%), and Corsican pine (15%).

Clear felling commenced on a moderately large scale in 1966 and currently averages about 40 ha per year. Clear felled areas are replanted with radiata pine almost exclusively, as this is by far the most productive species, achieving a mean annual increment on the better sites of over 30 m³ per ha.

The nearby Websters Hill plantation was commenced in 1963 and now has a nett area of 530 ha, mainly of radiata pine.

At Aire Valley thinning operations in radiata pine, which have been carried out intermittently since the early 1940s, have been frustrated by the broken topography and difficult access and weather conditions, and even the clear felling proved difficult until the introduction of a high lead cable system of logging.

The current authorised cut from the plantation is 34,000 m³ of sawlogs and peeler logs, together with additional pulpwood and preservation material.

(4) *Eastern Otways Plantation*: Plantation development has been taking place since 1968 in two locations, one near Forrest and the other near Bambra. Over 1,000 ha have been established and planting is planned to continue at 120 ha annually. Utilisation has not yet commenced.

POTENTIAL PRODUCTION

The mean annual increment of potentially merchantable wood from existing radiata plantations in the Otways is of the order of 20 m³ per hectare. Yields of at least 140,000 m³ of sawlogs, veneer logs, pulpwood, and round posts and poles for preservation can be expected from a balanced series of age classes in the completed plantation resource of 8,000 ha.

FUTURE TIMBER PRODUCTION FROM THE OTWAY FORESTS

The Otway forests are of importance for supplying many community needs, and particularly water, recreation and timber. The timber production is important from both the overall Victorian and the local points of view.

In the Victorian context the Otway State Forest includes about 4% of the State hardwood reserves and over 6% of the State softwood plantations. On the local scene it provides the basis for the important and growing timber-based industries in the area.

Forest management practices have been developed to enable timber production to take place in a manner which is compatible with most other uses of the forest, and it is anticipated that timber production will continue to be a legitimate and important use of much of the land within the Otway Ranges.

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